UNITED STATES PATENT AND TRADEMARK OFFICE

BEFORE THE BOARD OF PATENT APPEALS
AND INTERFERENCES

Ex parte ALBERT J. FRATTAROLA

Appeal 2007-0676
Application 09/803,221
Technology Center 3600

Decided: June 22, 2007

Before TERRY J. OWENS, STUART S. LEVY, and LINDA E. HORNER, *Administrative Patent Judges*.

HORNER, *Administrative Patent Judge*.

DECISION ON APPEAL

STATEMENT OF THE CASE

Appellant seeks our review under 35 U.S.C. § 134 of the Examiner's final rejection of claims 1-5, all of the pending claims in the application. We have jurisdiction under 35 U.S.C. § 6(b) (2002).

SUMMARY OF DECISION

We AFFIRM.

THE INVENTION

Appellant's claimed invention is to a captive screw for slideably securing a first structure to a second structure (Specification 2:19-20). Claim 1, reproduced below, is representative of the subject matter on appeal.

> 1. A captive screw including:
>
> a ferrule,
>
> a screw having a head, a shank adapted to pass through the ferrule, a threaded portion at the end of the shank opposite the head, and a collar formed on the shank proximate the threaded portion; and
>
> a spring,
>
> the screw being captivated on the ferrule between the head and the collar, the spring extending on the shank of the screw between the head and the ferrule.

THE REJECTIONS

The Examiner relies upon the following as evidence of unpatentability:

Ernest	US 3,465,803	Sep. 9, 1969
Damm	US 5,462,395	Oct. 31, 1995
Aukzemas	US 5,941,669	Aug. 24, 1999

The following rejections are before us for review.

1. Claim 1 stands rejected under 35 U.S.C. § 103(a) as unpatentable over the combination of Damm and Ernest.[1]
2. Claims 2-5 stand rejected under 35 U.S.C. § 103(a) as unpatentable over Damm, Ernest, and Aukzemas.[2]

ISSUE

Appellant contends that there would be no motivation for one having ordinary skill in the art to modify the screw of Ernest with the collar of Damm, because such a modification would destroy the intended operation of Ernest, neither reference provides any motivation for the combination, and Ernest already discloses a locking element that serves this function, so no advantage would be

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[1] The Examiner states the rejection of claim 1 as unpatentable over Damm in view of Ernest (Answer 3) and, in the alternative, Ernest in view of Damm (Answer 4). We treat these rejections together, because they are based on the same combination of references. *See In re Bush*, 296 F.2d 491, 496, 131 USPQ 263, 267 (CCPA 1961) ("where a rejection is predicated on two references each containing pertinent disclosure which has been pointed out to the applicant, we deem it to be of no significance, but merely a matter of exposition, that the rejection is stated to be on A in view of B instead of on B in view of A, or to term one reference primary and the other secondary.")

[2] Appellant misstates the rejection of claims 2-5 in the Brief as being rejected over Earnest in view of Aukzemas (Appeal Br. 3). The Examiner, however, clearly stated in the Final Rejection (at 3) and in the Answer (at 4), that "[c]laims 2-5 are rejected under 35 U.S.C. 103(a) as being unpatentable over modified Earnest [as modified by Damm] as applied to claim 1 above, and further in view of Aukzemas."

realized by substituting the collar of Damm (Appeal Br. 7-8). Appellants argue that Aukzemas, relied on by the Examiner for the rejection of dependent claims 2-5, fails to cure the deficiencies of Ernest and Damm (Appeal Br. 9).

The Examiner held that it would have been obvious to have a collar, as taught in Damm, formed on the shank of Ernest to facilitate assembly of the screw in the ferrule and to operate as a standoff to engage a surface of a panel to limit penetration (Answer 4). The issue before us is whether Appellant has shown that the Examiner erred in determining that the subject matter claim 1 is obvious in view of Ernest and Damm and the subject matter of claims 2-5 is obvious in view of Ernest, Damm, and Aukzemas.

FINDINGS OF FACT

The relevant facts include the following:

Ernest discloses a captive screw fastener 10 comprising a screw 14 extending through a hole 16 formed generally centrally in a retainer (ferrule) 18 (Ernest, col. 2, ll. 34-36). The screw 14 has a head 38 at an upper part, a threaded portion 36 at a lower part, and a neck (shank) 44 between the head 38 and threaded end 36 (Ernest, col. 2, ll. 55-56 and 62-65). As shown in Figure 2, the neck 44 of the screw 14 is adapted to pass through the retainer 18 (Ernest, Fig. 2). Ernest further discloses a locking element (collar) 56 "preferably of ring shape, and of plastic material, such as nylon" (Ernest, col. 3, ll. 11-13). "The locking element 56 has a central hole 58 which makes a loose fit with the screw neck 44, but the outer circular surface of the locking element, however, makes a tight fit with the

cylindrical surface 26" (Ernest, col. 3, ll. 14-17). Ernest discloses the locking element 56 is "formed" by being advanced over the threaded end 36 of screw 14 using a movable punch 88 that pushes the threaded screw part 36 through a hole in a strip 70 of plastic material (Ernest, col. 3, ll. 72-75). Since the diameter of the hole is smaller than the outer diameter of the threads, the strip tends to stretch and the hole tends to expand, but because the plastic material is resilient, it snaps back behind the threaded screw part 36, i.e., it tends to return to its initial hole size, after the threaded screw part 36 passes entirely through the strip 70 (Ernest, col. 3, l. 75 – col. 4, l. 8). The plastic ring 56 is then sheared from the strip 70 (Ernest, col. 4, ll. 34-35). As such, as shown in Figure 2, the screw is held captive on the retainer 18 between the head 38 and the locking element 56 (Ernest, Fig. 2).

Ernest also discloses a spring 50 coiled about the screw 14 and seated on the upper surface 34 of the retainer 18, and the spring, at its upper end, abuts the underside of the head 38 of the screw and biases the head upwardly at all times (Ernest, col. 2, ll. 71 – col. 3, l. 2). The spring 50 also tends to centrally align the screw 14 relative to the hole 16 in the retainer 18 (Ernest, col. 3, ll. 4-6). The spring 50, thus maintains the screw in a retracted position, with the locking element 56 preventing full withdrawal of the screw 14 from the retainer 18 (Ernest, col. 3, ll. 26-30). As such, as shown in Figure 2, the spring 50 extends on the neck 44 of the screw 14 between the head 38 and the retainer 18 (Ernest, Fig. 2).

Damm discloses a sound decoupling connecting element including a screw and an elastomeric formed body that holds the screw in a pre-mounted state using a stop and counterstop with limited axial movement, so that the screw cannot be lost

(Damm, col. 1, ll. 6-18). One object of Damm's connecting element is "to provide a sound decoupling connecting element ... which is comprised of as few parts as possible" (Damm, col. 3, ll. 13-15). In particular, Damm discloses a connecting element 1 consisting of two parts, a screw 2 and a formed body 3 (Damm, col. 6, ll. 48-50). The screw 2 has a head 4, a shaft 8 having a smooth part and a threaded part, and an upset swelling 13, which protrudes radially from the otherwise smooth diameter of the smooth part of the shaft (Damm, col. 6, ll. 51-67). The swelling 13 forms a shoulder 14 in an axial direction of the shaft 8 (Damm, col. 7, ll. 1-2). In use, the swelling 13 acts as a stop 24 against a corresponding counterstop 25 in the opening 16 of formed body 3 (Damm, col. 7, ll. 26-28). Once the connecting element 1 is assembled as a pre-mounted unit, by inserting the screw 2 into the formed body 3, the screw 2 is then held in the formed body, so that it cannot be lost, in part by stop 24 and counterstop 25 (Damm, col. 7, ll. 28-32). As such, Damm teaches that a captive screw can be formed by the cooperation of a collar (swelling 13) formed on the shank of a screw and a corresponding counterstop in the opening of a ferrule (formed body 3).

PRINCIPLES OF LAW

To assess an obviousness determination, we must first ascertain the scope of the claims. We determine the scope of the claims in patent applications not solely on the basis of the claim language, but upon giving claims their broadest reasonable construction in light of the specification as it would be interpreted by

one of ordinary skill in the art. *In re Am. Acad. of Sci. Tech. Ctr.*, 367 F.3d 1359, 1364, 70 USPQ2d 1827, 1830 (Fed. Cir. 2004).

Once we ascertain the scope and meaning of the claims, we then assess the obviousness rejections. "Section 103 forbids issuance of a patent when 'the differences between the subject matter sought to be patented and the prior art are such that the subject matter as a whole would have been obvious at the time the invention was made to a person having ordinary skill in the art to which said subject matter pertains.'" *KSR Int'l Co. v. Teleflex Inc.*, 127 S.Ct. 1727, 1734, 82 USPQ2d 1385, 1391 (2007). The question of obviousness is resolved on the basis of underlying factual determinations including (1) the scope and content of the prior art, (2) any differences between the claimed subject matter and the prior art, (3) the level of skill in the art, and (4) where in evidence, so-called secondary considerations. *Graham v. John Deere Co.*, 383 U.S. 1, 17-18, 148 USPQ 459, 467 (1966). *See also KSR*, 127 S.Ct. at 1734, 82 USPQ2d at 1391 ("While the sequence of these questions might be reordered in any particular case, the [*Graham*] factors continue to define the inquiry that controls.")

ANALYSIS

The Examiner, in his reading of Ernest, found it lacked disclosure of a "collar formed on the shank" of a screw, as recited in claim 1, and thus combined the teaching of Ernest with Damm, which teaches a collar formed as part of the shank of a screw. To be clear, we find that Ernest discloses all of the elements of

claim 1, including a "collar" disposed about the shank of the screw; however, it fails to disclose that the collar is "formed on" the shank of the screw.

The Specification does not define the term "collar" or what is meant by the phrase "formed on" as recited in claim 1. We give claims their broadest reasonable construction in light of the specification as it would be interpreted by one of ordinary skill in the art. A common definition of "collar" is "a ring or round flange upon, around, or against an object chiefly to restrain motion within given limits, to hold something in place, or to cover an opening (as on a shaft to prevent endwise motion or around a pipe where it enters a wall)" *Webster's Third International Dictionary* (unabridged) 444 (definition 2.d), G. & C. Merriam Co. (1971). As we found *supra*, Ernest's locking element 56 is of a ring shape, it is advanced over the threaded end 36 of the screw 14, and the screw is held captive on the retainer 18 between the head 38 of the screw and the locking element 56. Further, Ernest's locking element 56 is formed around the neck 44 of the screw 14 from a strip 70 of plastic material having a hole through which the threaded end 36 of the screw is pressed. As the end of the screw is pressed through the hole, the strip and hole expand until the threaded end passes completely through the hole, at which point the resilient plastic material snaps back behind the threaded screw part 36, i.e., the hole tends to return to its initial size. The plastic ring 56 is then formed around the screw by shearing it from the strip 70. As such, Ernest's locking element 56 is a collar formed around the shank proximate the threaded portion.

The only difference between Ernest's collar and the collar described in Appellant's Specification is that Ernest's collar is not fixed relative to the shank.

Rather, Ernest's collar slides freely with respect to the shank and is engaged at its outer surface against the inner surface of retainer 18. We understand the phrase "formed on" in claim 1 to require that the collar is either formed integrally with or otherwise affixed to the shank of the screw.

Substitution of the improved collar "formed on" the shank, as taught in Damm, in place of the locking element of Ernest would have been obvious to one having ordinary skill in the art. Damm discloses a swelling approximately on the middle region of the shaft, where the swelling functions to form a stop, which acts against a counterstop of a ferrule (formed body 3) to prevent the screw from being removed from the ferrule (Damm, col. 5, ll. 15-26). As such, the swelling of Damm performs the exact same function of retaining the screw as the locking element 56 of Ernest. A person of ordinary skill in the art would recognize that Damm's technique of forming a swelling on the shaft to act as a stop so as to limit the number of parts of the captive screw and for ease of assembly would improve similar captive screws, such as Ernest's screw, in the same way. As such, using Damm's technique would have been obvious, and Appellant has not provided any evidence or argument that application of Damm's technique to Ernest's screw would be beyond the skill of one of ordinary skill in the art. *See KSR,* 127 S. Ct. at 1740, 82 USPQ2d at 1396 ("[I]f a technique has been used to improve one device, and a person of ordinary skill in the art would recognize that it would improve similar devices in the same way, using the technique is obvious unless its actual application is beyond his or her skill"). Thus, we agree with the Examiner's reasoning that it would have been obvious for one having ordinary skill in the art at

the time the invention was made to have a collar formed as part of the shank of Ernest because it would facilitate assembly of the screw in the ferrule. In particular, to assemble the screw in the ferrule, the screw collar would simply have to be press fit through the reduced diameter portion of the ferrule (Answer 4). Further, Damm's teaching that an advantage of its design is to provide a connecting element which is comprised of as few parts as possible, (Damm, col. 3, ll. 13-15), would have provided an incentive to one skilled in the art to modify the captive screw of Ernest to eliminate the locking element 56, and the assembly associated therewith, for the ease of assembly of the screw as taught in Damm.

Appellant argues that "there would be no motivation for the collar in Damm without the compression gasket and if the collar were located anywhere along the shaft [of] Ernest it would destroy the intended operation of Ernest" (Appeal Br. 7). First, the Examiner provided a reason to use Damm's collar on Ernest's device that does not require the use of the compression gasket of Damm, i.e., to minimize the number of parts and for ease of assembly. As such, we are not persuaded by Appellant's first argument. As for Appellant's argument that Damm's collar would destroy the intended operation of Ernest, Appellant contends that if the modified collar were to act as a standoff, it would prevent Ernest's captive screw from being fully tightened to fasten the two parts together, and the two parts could be forced apart against the bias of Ernst's spring (Reply Br. 4). We fail to see how this is the case. If the swelling of Damm were added to the shank of Ernest, according to the teaching of Damm, it could be added anywhere along the middle portion of the shank. As long as this swelling or collar were added above the

threaded end of the shank and below the lower surface of the retainer, it would perform the function of acting as a stop to prevent complete removal of the screw and it would not interfere with tightening of the screw because when the screw was fully inserted into the second plate 13, the collar would rest above the surface of the plate. Further, the engagement of the threads on the threaded end of the screw with the counter threads in the nut 15 would prevent the bias of the spring 50 from forcing the plates 12 and 13 apart. As such, the Appellant has failed to persuade us of an error in the Examiner's reasoning.

Appellant argued that claims 2-5 are patentable because Aukzemas fails to the cure the deficiencies of Ernest and Damm. Finding no such deficiencies, Appellant has failed to persuade us of error in the Examiner's rejection of claims 2-5.

CONCLUSIONS OF LAW

We conclude Appellant has failed to show that the Examiner erred in rejecting under 35 U.S.C. § 103(a) claim 1 as unpatentable over Ernest and Damm and claims 2-5 as unpatentable over Ernest, Damm, and Aukzemas.

DECISION

The decision of the Examiner to reject claims 1-5 is AFFIRMED.

No time period for taking any subsequent action in connection with this appeal may be extended under 37 C.F.R. § 1.136(a). *See* 37 C.F.R. § 1.136(a)(1)(iv) (2006).

AFFIRMED

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